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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/821,245	04/09/2004	Koichiro Yokoyama	Q80974	8389
23373	7590	08/18/2006	EXAMINER	
SUGHRUE MION, PLLC 2100 PENNSYLVANIA AVENUE, N.W. SUITE 800 WASHINGTON, DC 20037			FIDLER, SHELBY LEE	
			ART UNIT	PAPER NUMBER
			2861	

DATE MAILED: 08/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/821,245	YOKOYAMA ET AL.	
	Examiner	Art Unit	
	Shelby Fidler	2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 13 June 2006.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 09 April 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☒ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>4/9/04 & 3/29/06</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

The information disclosure statements (IDS) submitted on 4/9/2004 and 3/29/2006 have been considered by the examiner.

Claim Objections

Claims 2-5 are objected to as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. These claims recite the limitation "said liquid ejection area," but there is no reference as to which of the plurality of liquid ejection areas the limitation refers. For the purpose of rejection, Examiner assumes that this limitation refers to the plurality of liquid ejection areas as a whole.

Claim 4 is objected to because of the following informalities: the recitation "same positions in main scanning direction" should be changed to "same positions in the main scanning direction." Appropriate correction is required.

Claim 6 is objected to as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The recitation "when the main and sub-liquid is ejected onto an upper end," is unclear in the context of the claim since it does not clearly state which liquid is ejected.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

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A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 10 and 11 are rejected under 35 U.S.C. 102(e) as being anticipated by Crosby et al. (US 6840617 B2).

Regarding claim 10:

Crosby teaches a liquid ejecting apparatus (*printer 10*) for performing recording on a recording material (*sheet 22*) conveyed to a plurality of liquid ejection areas (*areas defined by nozzle arrays 26a-26c, Fig. 2*) arranged in a feeding direction of the recording material (*Fig. 2*), by ejecting liquid onto the recording material, comprising:

a liquid ejecting head (*printheads 26 and 28, Figure 1*) reciprocating in a main scanning direction (*main scanning direction 42, Figure 1*) substantially crossing the feeding direction of the recording material (*sheet feed direction 54, Figure 1*);

a plurality of nozzle arrays (*nozzle arrays 26a-26c, Fig. 2*) separately provided from each other in the feeding direction on a surface of the liquid ejecting head facing the recording material for ejecting liquid respectively (*nozzle arrays 26a/b/c separated along sheet feed direction 54, Figure 2*); and

at least one support rib disposed to face areas between the main nozzle arrays via the recording material (*ribs 74 and 76 disposed between nozzle arrays 26a-26c, Figure 2*);

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a wall (*first wall 78*) disposed upstream in the feeding direction of the most upstream one of the plurality of liquid ejection areas (*Fig. 2*), the wall guiding the recording material to the plurality of liquid ejection areas (*surface 60a of wall 78 guides sheet 22 as shown in Fig. 2*);

wherein a plurality of recess sections (*elements 62, 64, and 66, Figure 2*) are formed extending in the main scanning direction at positions facing the nozzle arrays via the recording material respectively (*col. 4, lines 18-30*) and dented to be lower than the support rib around the support rib (*base 58 is lower than partitions 74,76, Figure 2*).

Regarding claim 11:

Crosby teaches that at least one liquid absorption material (*absorption pad 82*) is disposed in the recess sections for absorbing liquid ejected from the nozzle arrays (*col. 4, lines 56-61*).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-5 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuki (US 6746101 B2) in view of Kida et al. (US 6659603 B2) and Crosby et al. (US 6840617 B2).

Regarding claim 1:

Otsuki teaches a liquid ejecting apparatus (*printer 22, Fig. 4*) for performing recording on a recording material (*printing paper P, Fig. 1*) conveyed to a plurality of liquid ejection areas (*areas corresponding to nozzle groups Nf, Nm, and Nr*), arranged in a feeding direction of the

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recording material (*Figs. 6, 20, and 23*) by ejecting liquid onto the recording material, comprising:

a plurality of first transfer rollers (*elements 25b or 25d, Figure 20*) separately provided from each other in a substantially same line along a main scanning direction crossing the feeding direction of the recording material (*elements 25 are separated along main scanning direction, Figure 20*), for transferring the recording material in the feeding direction (*paper feed rollers, col. 12, lines 42-51*);

a plurality of first ribs (*ribs of central portion 26c*) disposed downstream in the feeding direction of the most upstream one of the plurality of liquid ejection areas (*downstream of the area corresponding to nozzle group Nf; Fig. 20*) for supporting the recording material on a surface of the recording material opposite the liquid ejection surface (*col. 3, lines 16-18*), directions and distances of the first ribs from the first transfer rollers in the feeding direction being substantially equal to each other (*Fig. 6*); and

a first liquid absorption material (*absorbent members 27*) disposed between the first transfer rollers and the first ribs for absorbing the liquid (*col. 14, lines 15-19 with slot 26f, Figure 20*).

Otsuki does not expressly teach a wall disposed upstream in the feeding direction of the most upstream one of the plurality of liquid ejection areas, the wall guiding the recording material to the plurality of liquid ejection areas.

However, Kida teaches transfer rollers (*rollers 9, Fig. 4*) bending the recording material inwards on a liquid ejection surface of the recording material in the liquid ejection area (*col. 6, lines 24-26*), and ribs (*ribs 17*) being placed at substantially same positions in the main scanning direction as first transfer rollers respectively (*Figs. 4 and 5*).

Otsuki as modified by Kida do not expressly teach a wall disposed upstream in the feeding direction of the most upstream one of the plurality of liquid ejection areas, the wall guiding the recording material to the plurality of liquid ejection areas.

However, Crosby teaches a wall (*first wall 78*) disposed upstream in the feeding direction of the most upstream one of the plurality of liquid ejection areas (*Fig. 2*), the wall guiding the recording material to the plurality of liquid ejection areas (*surface 60a of wall 78 guides sheet 22 as shown in Fig. 2*).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize ribs placed at the same positions as the transfer rollers (*Kida*), and to utilize a wall upstream feeding direction (*Crosby*) into Otsuki's invention. The motivation for doing so, as taught by Kida, is to effectively exert the cockling forces onto the ribs (*col. 6, lines 35-40*). The motivation for doing so, as taught by Crosby et al., is to provide support for print medium as it is transported through the print zone (*col. 4, lines 15-17, 62-66*).

Regarding claim 2:

Otsuki as modified by Kida and Crosby teach that the first transfer rollers (*elements 25b of Otsuki*) convey the recording material to the plurality of liquid ejection areas (*elements 25b feed according to arrow SS; Fig. 6 of Otsuki*), and

the first ribs (*ribs of central portion 26c of Otsuki*) are disposed downstream of the feeding direction of the recording material against the first transfer rollers (*Fig. 6 of Otsuki*).

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Regarding claim 3:

Otsuki as modified by Kida and Crosby teach a plurality of second transfer rollers (*elements 25d of Otsuki*) disposed downstream of the feeding direction of the recording material against the first liquid absorption material (*elements 25d downstream of slot 26f, Figure 21 of Otsuki*), for conveying the recording material out of the liquid ejection area (*elements 25d convey according to arrow A, Figure 21 of Otsuki*);

a plurality of second ribs (*partition 76 of Fig. 2 with col. 5, lines 9-11 of Crosby*) disposed in the liquid ejection area for supporting the recording material on the surface of the recording material opposite the liquid ejection surface (*col. 4, lines 15-17, 62-66 of Crosby*), and being placed at substantially same positions between the second transfer rollers and the first ribs in the feeding direction (*Figs. 2 and 3 of Crosby*); and

a second liquid absorption material (*element 82 of Crosby*) disposed between the second transfer rollers and the second ribs for absorbing the liquid (*element 66, Figure 2 with col. 4, lines 56-61 of Crosby*).

Regarding claim 4:

Otsuki as modified by Kida and Crosby teach that the second transfer rollers are second ribs are arranged at substantially same positions in the main scanning direction as the first transfer rollers and the first ribs respectively (*Figs. 2 and 3 of Crosby et al.*).

Regarding claim 5:

Otsuki as modified by Kida and Crosby teach that the first transfer rollers (*25b of Otsuki*) convey the recording material out of the liquid ejection area (*feed according to arrow SS; Fig. 6 of Otsuki*), and

the first ribs are disposed upstream of the feeding direction of the recording material against the first transfer rollers (*Fig. 6 of Otsuki*).

Regarding claim 14:

Otsuki as modified by Kida and Crosby teach a plurality of second ribs (*partition 76 and col. 5, lines 9-11 of Crosby et al.*) separately disposed downstream of the plurality of first ribs (*Figs. 2 and 3 of Crosby et al.*), the plurality of second ribs being distanced from the plurality of first ribs (*Figs. 2 and 3 of Crosby et al.*).

Claims 6 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuki et al. (US 6629744 B2) in view of Crosby et al. (US 6840617 B2) and Meyer (US 6239817 B1).

Regarding claim 6:

Otsuki teaches a liquid ejecting apparatus for performing recording on a recording material by ejecting liquid onto the recording material, comprising:

a liquid ejecting head (*printing head 28*) reciprocating in a main scanning direction (*MS, Fig. 3*) substantially crossing a feeding direction of the recording material (*SS, Fig. 3*);

a plurality of main nozzle arrays (*nozzles of actuator chips 94-96*) separately provided from each other in the feeding direction on a surface of the liquid ejecting head (*Fig. 3*) facing the recording material for ejecting different main liquid respectively (*color inks; col. 9, line 66 – col. 10, line 3*);

an upstream sub-nozzle array (*nozzles of actuator chip 93, Fig. 3*) provided on the surface of the liquid ejecting head facing the recording material for ejecting sub-liquid onto an area different from that of the main liquid (*black ink; col. 9, lines 66-67*), the upstream sub-nozzle array

being disposed at a substantially same position in the feeding direction as one of the main nozzle arrays positioned most upstream of the feeding direction (*Fig. 3*);

a control unit (*control circuit 40*) for controlling the sub-liquid to be ejected from the upstream sub-nozzle array (*col. 9, lines 26-30*);

wherein the liquid ejecting head further comprises a downstream sub-nozzle array (*nozzles of actuator chip 91; Fig. 3*) for ejecting the sub-liquid (*black ink; col. 9, lines 66-67*) onto an area different from that of the main liquid (*different print areas are inherent to the different actuator chips in Fig. 3*).

Otsuki does not expressly teach at least one support rib disposed to face areas between the main nozzle arrays via the recording material for supporting the recording material.

However, Crosby et al. teach at least one support rib (*elements 74 and 76*) disposed to face areas between the main nozzle arrays via the recording material (*Fig. 2*) for supporting the recording material (*col. 2, lines 35-37*).

Otsuki as modified by Crosby et al. do not expressly teach controlling the sub-liquid to be ejected from the upstream sub-nozzle array when the main and sub-liquid is ejected onto an upper end of the recording material; and

the control unit uses the upstream sub-nozzle array when the sub-liquid is ejected onto the upper end of the recording material, whereas using the downstream sub-nozzle array when the sub-liquid is ejected onto a lower end of the recording material, in case only the sub-liquid is ejected onto the recording material without ejection of the main liquid.

However, Meyer teaches a control unit (*controller 66*) for controlling the sub-liquid to be ejected from the upstream sub-nozzle array when the main and sub-liquid is ejected onto an upper end (*leading edge 42*) of the recording material (*col. 3, lines 27-33 and Fig. 4A*); and

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the control unit uses the upstream sub-nozzle array when the sub-liquid is ejected onto the upper end of the recording material (*col. 3, lines 27-33 and Fig. 4*), whereas using the downstream sub-nozzle array when the sub-liquid is ejected onto a lower end (*trailing edge 148*) of the recording material (*col. 3, lines 27-33 and Fig. 7*)

At the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize support ribs disposed to face areas between the main nozzle arrays (*Crosby et al.*), and to utilize Meyer's control unit into Otsuki's invention. The motivation for doing so, as taught by Crosby et al., is to provide support for the print medium (*col. 4, lines 15-17*) and be able to collect waste ink ejected from the printhead (*col. 4, lines 18-30*). The motivation for doing so, as taught by Meyer, is to provide a borderless print (*col. 4, lines 1-5*).

Regarding claim 9:

Otsuki as modified by Crosby et al. and Meyer teach the liquid ejecting apparatus is an inkjet type recording apparatus (*col. 8, lines 61-63 of Otsuki*), and

the liquid ejecting head ejects ink of a plurality of colors except black for color recording from the plurality of main nozzle arrays, whereas ejecting black ink from the sub-nozzle arrays (*col. 9, line 66 – col. 10, line 3 of Otsuki*).

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Otsuki et al. (US 6629744 B2) in view of Crosby et al. (US 6840617 B2) and Meyer (US 6239817 B1), as applied to claim 6 above, and further in view of Otsuki (US 6746101 B2).

Regarding claim 8:

Otsuki '744 as modified by Crosby et al. and Meyer teach an auxiliary sub-nozzle array (*nozzles on actuator chip 92 of Otsuki '744*) disposed between the upstream and downstream sub-nozzle arrays in the feeding direction (*Fig. 3 of Otsuki '744*)

Otsuki as modified by Crosby et al. and Meyer do not expressly teach that the control unit uses the upstream, downstream, and auxiliary sub-nozzle arrays when the sub-liquid is ejected onto an area except the upper and lower ends of the recording material.

Otsuki '101 teaches that the control unit uses the upstream, downstream, and auxiliary sub-nozzle arrays when the sub-liquid is ejected onto an area except the upper and lower ends of the recording material (*Figs. 17 and 19*).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize the nozzle array control of Otsuki '101 into the invention of Otsuki '744 as modified by Crosby et al. and Meyer. The motivation for doing so, as taught by Otsuki '101, is to prevent blank spaces from forming in the edge portions of the paper (abstract).

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crosby et al. (US 6840617 B2) in view of Kida et al. (US 6659603 B2).

Regarding claim 12:

Crosby et al. teach a plurality of first ribs (*element 74, Figure 2 with col. 5, lines 9-11*); and a plurality of second ribs (*element 76 with col. 5, lines 9-11*).

Crosby et al. do not expressly teach a plurality of first transfer rollers separately provided from each other in an approximately same line along the main scanning direction, for transferring the recording material in the feeding direction while bending the recording

material inwards on a liquid ejection surface of the recording material at a position facing the liquid ejecting head; and

a plurality of second transfer rollers disposed downstream of the feeding direction against the support rib, for conveying the recording material out of the position facing the liquid ejecting head while bending the recording material inwards on the liquid ejecting surface at the position facing the liquid ejecting head,

the first ribs placed at substantially same positions in the main scanning direction as the first transfer rollers respectively, directions and distances of the first ribs from the first transfer rollers in the feeding direction being substantially equal to each other; and

a plurality of second ribs placed at substantially same positions in the main scanning direction as the second transfer rollers respectively, and being placed at substantially same positions between the second transfer rollers and the first ribs in the feeding direction

However, Kida et al. teach a plurality of first transfer rollers (*elements 9*) separately provided from each other in an approximately same line along the main scanning direction (*elements 9 disposed along same line, Figure 2*), for transferring the recording material in the feeding direction while bending the recording material inwards on a liquid ejection surface of the recording material at a position facing the liquid ejecting head (*element 7 is bent inwards multiple times, forming a wave, Figure 4*); and

a plurality of second transfer rollers (*elements 14*) disposed downstream of the feeding direction against the support rib (*elements 14 located downstream of ribs 17, Figure 2*), for conveying the recording material out of the position facing the liquid ejecting head while bending the recording material inwards on the liquid ejecting surface at the position facing the liquid ejecting head (*element 7 is bent inwards at multiple locations, forming a wave, Figure 4*),

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the first ribs placed at substantially same positions in the main scanning direction as the first transfer rollers respectively (*ribs 17 are aligned with first rollers 9, Figure 5*), directions and distances of the first ribs from the first transfer rollers in the feeding direction being substantially equal to each other (*each rib is equally spaced from its respective roller, Figure 5*); and

the second ribs placed at substantially same positions in the main scanning direction as the second transfer rollers respectively (*ribs 17 are aligned with first rollers 14, Figure 5*), and being placed at substantially same positions between the second transfer rollers and the first ribs in the feeding direction (*each rib is equally spaced from its respective roller, Figure 5*).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to utilize ribs placed at the same positions as the transfer rollers, and to utilize transfer rollers that bend the recording material inwards on a liquid ejection surface into the invention of Crosby et al. The motivation for doing so, as taught by Kida, is to effectively exert the cockling forces onto the ribs (*col. 6, lines 35-40*).

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Crosby et al. (US 6840617 B2) in view of Meyer (US 6239817 B1).

Regarding claim 13:

Crosby et al. teach a control unit (*controller 18*) for controlling the nozzle arrays, wherein the plurality of nozzle arrays comprises:

an upstream nozzle array (*element 26a*); and

a downstream nozzle array (*element 26c*) disposed downstream of the feeding direction against the upstream nozzle array (*Fig. 2*).

Crosby et al. does not expressly teach that the control unit uses the upstream nozzle array when the liquid is ejected onto an upper end of the recording material, whereas using the downstream nozzle array when the liquid is ejected onto a lower end of the recording material.

However, Meyer teaches that the control unit uses the upstream nozzle array when the liquid is ejected onto an upper end of the recording material (*printhead 27 uses upstream portion to eject on edge 42 of medium*), whereas using the downstream nozzle array when the liquid is ejected onto a lower end of the recording material (*printhead 27 uses downstream portion to eject on edge 48 of medium*).

At the time of invention, it would have been obvious to a person of ordinary skill in the art to modify Crosby's invention with Meyer's control system. The motivation for doing so, as taught by Meyer, is to spray ink up to the edge of the recording material (*col. 4, lines 36-40*).

Response to Arguments

Applicant's arguments with respect to claims 6, 8, and 9 have been considered but are moot in view of the new ground(s) of rejection. Please see above rejection of Otsuki et al. (US 6629744 B2) in view of Crosby et al. (US 6840617 B2) and Meyer (US 6239817 B1), which discloses a downstream sub-nozzle array provided at substantially the same position in the feeding direction the one of the main nozzle arrays in the most downstream position.

Communication with the USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shelby Fidler whose telephone number is (571) 272-8455. The examiner can normally be reached on MWF 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vip Patel can be reached on (571) 272-2458. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

SF 8/14/06

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